TO: Director, National Institute for Occupational Safety and Health

FROM: California Fatality Assessment and Control Evaluation (FACE) Program

SUBJECT: Poultry worker is caught in the metal paddles of a feather dryer and dies in California

SUMMARY

California Face Report 98CA00401

A 39-year old poultry worker (decedent) died when a feather dryer was turned on and he was struck by and caught in the metal paddles. The decedent had been cleaning out the feather dryer tank for about thirty minutes when the paddle drive motor was started by another employee. The feather dryer was not locked/tagged out and the employer did not have a lock/tag out program. There were no caution signs warning employees of the danger of entering the tank. The entry hatch to the tank was not interlocked to prevent motor startup. The employer did not have documentation for the performance of safety inspections nor for conducting training. The CA/FACE investigator determined that, in order to prevent future occurrences, employers should:

- develop and implement formal lockout/tagout programs which include an energy control procedure.
- install interlocks on the hatches of such tanks to prevent startup during maintenance.
- place caution signs to warn employees of the potential hazard of entering such tanks without proper lockout/tagout.
- develop training programs that address lockout/tagout, energy control, interlocks and caution signs.

INTRODUCTION

On March 23, 1998, at 8:05 a.m., a 39-year old male poultry worker was fatally injured when the motor which drives the metal paddles of a feather dryer was turned on. The paddles struck the employee numerous times before he was caught between the paddles and the wall of the dryer and the motor turned off. The decedent had been inside the feather dryer tank for 30 minutes cleaning it when the motor was started. He sustained massive trauma to the head, chest and abdomen.

The CA/FACE investigator learned of this incident on March 31, 1998 from the county coroner's office. On April 1, 1998, the CA/FACE investigator traveled to the incident site where he met with company management and the company's attorney. The CA/FACE investigator interviewed three witnesses through an interpreter. On April 5, 1998, the CA/FACE investigator revisited the site of the incident to examine and photograph the feather dryer.

The business, a poultry ranch, had operated for 95 years at the time of the incident. The company had 170 employees with 35 to 40 working on site at the time of the incident. Four employees were working in the feather room at the time of the incident. The decedent had worked for the company for 2 years and 5 months and had worked at the site of the incident the entire time. According to company management, superintendents have site safety responsibility and, in their absence, the site foreman assumes responsibility. The superintendent/site safety representative was on a leave of absence at the time of the incident. The company did not have a complete written Injury and Illness Prevention Program (IIPP) or code of safe practices. According to company management, the decedent was trained in the operation and maintenance of the feather dryer, but documentation could not be provided. According to company management, the company had written generic procedures for operating equipment, but not specifically for the use of the feather dryer. A copy of the procedures was not submitted to the CA/FACE investigator. Company management stated that specific information was passed on verbally in the training and safety sessions. According to company management, safety meetings were held on a monthly basis. No documentation of safety meetings or safety inspections of the facility or its equipment was available.

INVESTIGATION

The site of the incident is a large poultry ranch containing several buildings and thousands of birds. The birds are hatched on the premises and grown for eating. Although the birds are not slaughtered on the premises, many feathers are retrieved from the slaughter house and shipped in barrels back to the poultry ranch. At the ranch, the feathers go through a washing process and then are dried and bagged. The feathers are used for commercial purposes such as the manufacturing of pillows.

The process for cleaning and drying the feathers is to dump them from the barrels into the washing machine (**Exhibit 1**) where they are washed and spun to a damp condition. After that, the feathers are vacuumed up by a large diameter hose which sucks them into the feather dryer tank (**Exhibit 2**). The feathers are dried by being spun around by the metal paddles in warm air. When the feathers are dry they are sucked out through a plenum and into a series of four bags (**Exhibit 3**). When the bags are full, they are tied and stored for later shipping.

On the day of the incident, the decedent was cleaning out the feather dryer tank. Since not all feathers are able to be extracted through the process, the tank requires periodic cleaning. Cleaning of each of the two feather dryers is done every Monday morning. Employees assigned to clean the feather dryer are rotated on a weekly basis. The decedent accessed the inside of the tank through a hatch approximately two-feet square (**Exhibit 4 & 5**).

Inside the tank is a series of four, multi-blade paddles (similar to paddle wheels) which rotate on a single shaft (**Exhibit 6**). They are driven by an electric motor located on the north

side of the feather dryer (**Exhibit 7**). To clean the tank, the decedent had to reach in and around the paddles to clean the floor and the walls.

The decedent had been inside the tank performing the cleaning process for approximately 30 minutes. At that time, two other employees, the maintenance worker in charge of overall facility maintenance (employee #1) and the maintenance worker for the incubator area (employee #2) arrived to perform other work.

After their work was complete employee #1 noted that the cover of an electrical disconnect box, the one feeding the feather dryer paddle motor, was secured with wire. Employee #1 asked employee #2 to secure the cover with a screw. This disconnect box was located just below other electrical disconnect boxes and control switches. As employee #2 continued working on the control box cover, the cover dropped down and, according to employee #2, the cover struck the button that starts the paddle motor. This caused the motor to start and the paddles to turn. Although all of the switches and disconnect boxes had been removed when the CA/FACE investigator arrived, photographs show all switches to be located above the disconnect box on which employee #2 was working. Employee #2 stated in the police report that he and employee #1 had completed their task and was walking away when the dryer paddles started to turn on their own**.**

Employee #1 stated during his interview that a screw fell into the disconnect box and caused the motor to start and the paddles to turn. In the written statement, employee #1 stated that the disconnect box cover fell onto the start button for the paddles which caused the motor to start and the paddles to turn**.** When the dryer started, another employee (employee #3) who was applying grease to the motor of the other feather dryer yelled and ran over to employees #1 and #2 indicating that the decedent was inside of the feather dryer.

Employee #1 turned off the switches and breakers located above the paddle wheel disconnect box on which he had been working. Employee #2 ran out of the feather room and into an adjacent room to turn off the circuit breakers at the electrical panel (**Exhibit 8**).

Employees #1 and #2 and a foreman (employee #4) went into the feather dryer to extract the decedent, but could not. The decedent was pinned by the blades of the paddles. The paramedics were dispatched at 8:12 a.m. and arrived at 8:18 a.m. The fire department found electrical power still being fed to the machine. They turned it off and also removed the motor's drive belts prior to entering the feather dryer**.** They and other fire department personnel spent 35 minutes cutting away portions of the paddle in order to retrieve the decedent. The decedent was transported to a local hospital and, shortly after admission, at 9:21 a.m., was pronounced dead.

CAUSE OF DEATH

The certificate of death stated the cause of death to be asphyxia due to mechanical compression of the torso.

RECOMMENDATIONS/DISCUSSION

[Due to inconsistent witness statements and removal of evidence, the FACE investigation could not determine the exact cause for the feather dryer's paddle motor starting. Therefore, only some of the factors contributing to the victim's death could definitely be determined. These factors

form the basis for the following recommendations.]

Recommendation #1: Employers should develop and implement a formal lockout/tagout program.
Discussion: It is imperative that machinery which is capable of movement should be de-energized, disengaged, or, if necessary, blocked prior to any cleaning or maintenance. In addition, the source of energy must be locked out so others cannot re-energize the machine when an employee is in an area of danger. It is also necessary to place tags at the energy sources to warn others that the machine is locked out of service. In this incident, the machine was was not properly locked out with disconnect switches or circuit breakers. The drive belt could have been removed to disengage the motor from the paddles. The sources of energy for the machine did not have locks or warning tags in place at the time of the incident. If the feather dryer had been properly locked out and tagged out, this incident may not have happened.

Recommendation #2: Employers should install interlocks on the hatches of such tanks to prevent startup during maintenance.
Discussion: The hatch (door) to the feather dryer involved in this instance was not equipped with an interlock. An interlock is a device usually electrical and/or mechanical which disconnects the primary energy source to a machine. If the interlock of an operating machine is activated, the machine's motion or action will cease. In this case, if the hatch was left open, the interlock, if installed, would have remained activated and the feather dryer would not have started.

Recommendation #3: Employers should place caution signs to warn employees of the potential hazard of entering such tanks without proper lockout/tagout.
Discussion: Machines capable of injuring an employee should have caution signs placed at danger zones. In this incident, there were no signs warning employees of the potential for injury due to rotating machinery, or for the need for proper lockout/tagout of the dryer prior to entry. The victim did not lock or tag the electrical disconnect or circuit breakers prior to entering the dryer. Signs would have reminded the decedent and his co-workers to lockout/tagout the dryer prior to working on it.

Recommendation #4: Employers should develop training programs that address lockout/tagout, energy control, interlocks and caution signs.
Discussion: There was no formal training program that addressed the hazards of the feather dryer. When workers are first employed or first assigned to an area containing potentially hazardous machinery, they need to be formally trained in all aspects of safely operating or working on the machine. An energy control procedure would be appropriate for the feather dryer. It would detail the scope, purpose, authorization, rules, and techniques used to control potentially hazardous energy. Included should be the procedural steps for the placement, removal, and transfer of lockout and tagout devices and the responsibility for them. If necessary, a procedural checkoff and signoff sheet could be developed as long as any changes to the

machine are immediately reflected in the checkoff sheet. Training should also address the proper use of interlocks including why they were installed, how they work and their purpose. In addition, employees should be trained on the recognition of caution signs, including the meaning of sign colors, why they were placed on the machine, and what the wording signifies. Employee training should be documented and refresher training should be provided as needed.

References:

Barclays Official California Code of Regulations, Vol. 9, Title 8, Industrial Relations, South San Francisco, 1998

For general information regarding machine safety, including lockout/tagout refer to: http.www.dir.ca.gov./title8/3314.html, /4413, /4188, /3340, /3328

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FATALITY ASSESSMENT AND CONTROL EVALUATION PROGRAM

The California Department of Health Services, in cooperation with the California Public Health Foundation, and the National Institute for Occupational Safety and Health (NIOSH), conducts investigations on work-related fatalities. The goal of this program, known as the California Fatality Assessment and Control Evaluation (CA/FACE), is to prevent fatal work injuries in the future. CA/FACE aims to achieve this goal by studying the work environment, the worker, the task the worker was performing, the tools the worker was using, the energy exchange resulting in

fatal injury, and the role of management in controlling how these factors interact.

NIOSH funded state-based FACE programs include: Alaska, California, Iowa, Kentucky, Maryland, Massachusetts, Maryland, Minnesota, Missouri, Nebraska, New Jersey, Ohio, Oklahoma, Texas, Washington, West Virginia, and Wisconsin.

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Additional information regarding the CA/FACE program is available from:

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